A NEW SPECIES OF *NEOPLATYCERUS* (HYMENOPTERA: ENCYRTIDAE) FROM EGYPT, PARASITOID OF THE VINE MEALYBUG, *PLANOCOCCUS FICUS* (HOMOPTERA: PSEUDOCOCCIDAE)[1]

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ABSTRACT: A new species of the little known encyrtid wasp genus *Neoplatycerus* is described from the Nile River delta in Egypt. A part of the type series of *N. kemticus* sp. n. was reared from the vine mealybug, *Planococcus ficus*, on grape, and this host association makes it a candidate agent for introduction into California vineyards for the on-going classical biological control program against this pest. A key to the three described species of *Neoplatycerus* in the world is provided.

Among the material of Encyrtidae (Hymenoptera: Chalcidoidea) parasitoids of the pink hibiscus mealybug, *Maconellicoccus hirsutus* (Green), as well as of some other mealybugs (Homoptera: Pseudococcidae) in Egypt, sent to the junior author for identification by Dr. Ahmed H. El-Heneidy, a new species of the little known genus *Neoplatycerus* Subba Rao was found. It was reared in the Nile River delta from an unidentified *Planococcus* species on grape, very likely the vine mealybug, *P. ficus* (Signoret). Later, a larger series of the same species, reared in Giza, Egypt, from *P. ficus* on grape, was kindly provided for our study by Dr. John S. Noyes.

We believe, based on the available information on host associations of the other species of *Neoplatycerus* from Israel (Rivnay 1945), that the new taxon described below almost certainly is a primary parasitoid of *P. ficus*. This new host record, combined with the apparent climatic similarities between the upper Nile River delta and the valleys of southern and central California, makes this new species a promising candidate for introduction into California against *P. ficus*. The latter is a serious pest in table and raisin grapes in California and a classical biological program against it is being implemented there using species from other encyrtid genera such as *Anagyrus* Howard and *Leptomastidea* Mercet (Daniel González, personal communication). No species of *Neoplatycerus* has ever been tried as a biological control agent against a mealybug host.

Terms for morphological features are those of Gibson (1997). Acronyms for depositories of specimens are as follows: BMNH, The Natural History Museum, London, England, UK; PPCE, Plant Protection Research Institute, Cairo, Egypt; UCRC, Entomology Research Museum, University of Califor-

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nia, Riverside, California, USA; ZISP, Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia. An abbreviation used in the text is: F = antennal funicle segment.

Genus *Neoplatycerus* Subba Rao, 1965

Neoplatycerus Subba Rao, 1965: 150. Type species: *Neoplatycerus tachikawai* Subba Rao, 1965, by monotypy and original designation.

Neoplatycerus Subba Rao; Hayat et al., 1975: 7, 18; Noyes and Hayat, 1984: 306-307; Trjapitzin, 1989: 125.

Diagnosis. The important distinguishing morphological characteristics of *Neoplatycerus* are as follows.

Female. Body robust. Frontovertex very wide; ocelli in an obtuse triangle. Facial cavity, formed by scrobes, either deep, delimited apically by a well-developed acute ridge, or shallow, delimited both apically and laterally, or only laterally, by acute margins. Antenna inserted close to mouth margin; foliaceous, strongly broadened and flattened; scape with a strongly curved ventral margin and a slightly curved dorsal margin with a well-developed outer flange; pedicel subtriangular, wider than long; funicle 6-segmented, all funicle segments strongly transverse; clava entire, strongly obliquely truncate. Mandible with 2 teeth; maxillary palpus 4-segmented, labial palpus 3-segmented. Pronotum short; mesoscutum without notauli. Wings not abbreviated; forewing infuscated, submarginal vein without a triangular expansion, marginal vein punctiform, stigmal vein strongly curved, postmarginal vein not as short as or slightly shorter than stigmal vein. Gaster with ovipositor not protruding; paratergites present in the type species.

Male (not known for the type species). Antenna not foliaceously enlarged, with scape only slightly or moderately broadened and flattened; pedicel longer than wide; funicle 6- segmented, with all segments somewhat wider than long, or F1 subquadrate; clava entire, not truncate; pubescence of flagellum very short.

Comments. Depending on the classification, the genus *Neoplatycerus* is placed either in the tribe Chrysoplatycerini, subtribe Chrysoplatycerina (Trjapitzin 1989) or the tribe Aenasiini (Noyes and Hayat 1994) of the subfamily Tetracneminae.

The clava of the female antenna of the type species *N. tachikawai* from India was initially reported to be two-segmented (Subba Rao 1965). However, Hayat et al. (1975) illustrated the antenna of *N. tachikawai* as having a solid clava and also stated in one of the couplets of their "Key to some Indian genera of the Anagyrini based on females" that the clava in *Neoplatycerus* is indeed unsegmented. Later, Noyes and Hayat (1984) provided a drawing of the female antenna of an Oriental *Neoplatycerus* species, also with a solid clava, noting that at least three undescribed species of this genus were known to them from India and Malaysia.

Key to the described species of *Neoplatycerus*, females.

1 Clava about as wide as long ..... *N. tachikawai* Subba Rao
– Clava distinctly longer than wide 2

2 Head and mesosoma black ..... *N. kemticus*, new species
– Head and mesosoma brown ..... *N. palestinensis* (Rivnay)

Neoplatycerus tachikawai Subba Rao, 1965

Neoplatycerus tachikawai Subba Rao, 1965: 150-152; Hayat et al., 1975: 18, 20.

Type locality: Bhubaneswar, Orissa, India.
Distribution: India (Orissa, Uttar Pradesh).
Hosts: *Icerya seychellarum* (Westwood) (Margarodidae), *?Pulvinaria* sp. (Coccidae), and *Rastrococcus iceryoides* (Green) (Pseudococcidae).

Comments. *Neoplatycerus tachikawai* was illustrated in detail by Hayat et al. (1975). In Shahjahanpur, Uttar Pradesh, this species was reared from *R. iceryoides* on *Mangifera indica* L. (Hayat et al. 1975).

Neoplatycerus kemticus V. Trjapitzin & S. Triapitsyn, new species
(Figs. 1-4)

Female. Length 1.09-1.45 mm. Head lentiform, as wide as high. Frontovertex convex; vertex about 1/2 head width. Occipital margin right. Inner orbits of eyes slightly diverging anteriad. Temples present but short, about 1/8 maximum diameter of eye. Ocelli in a slightly obtuse triangle (somewhat more than 90°). Distance between posterior ocelli 2 x more than distance between posterior ocelli to anterior ocellus and considerably more than distance to eye margins (10 : 4). Ratio of distance between upper margin of facial cavity to mouth margin and head height 15 : 38. Facial cavity, formed by scrobes, very shallow but wide, delimited apically and laterally by acute margins. Antenna inserted not far from oral margin; torulus clearly at below level of lower eye margin. Distance between toruli 3.75-5.00 x more than distance from torulus to mouth margin, the latter concave. Width of oral aperture about 1/3 head width. Malar space equal to maximum height of eye; its sides almost right. Interocular prominence weakly pronounced, low.

Antenna strongly broadened and flattened (Fig. 1). Scape about 1.7 x as long as its greatest width, with dorsal outer flange. Pedicel triangular, flat dorsally. All funicle segments transverse. Clava undivided, more or less obtusely pointed, longer than wide and longer than funicle.

Mesosoma convex. Pronotum short; mesoscutum 2 x as wide as long; scutellum subtriangular, 1.5 x as wide as long and about as long as mesoscutum. Metapleuron visible, very narrow, widening ventrally. Propodeum very short medially and well developed laterally.

Wings not abbreviated, at least reaching apex of gaster or slightly exserted beyond it. Forewing (Fig. 2) about 3.0 x as long as its maximum width. Costal cell 17 x longer than wide. Marginal vein punctiform; stigmal vein strongly curved, not broadened at apex; postmarginal vein long, its apex slightly exceeds level of stigmal vein apex.

Gaster a little longer than mesosoma. Ovipositor practically not exserted. Pygostyles about at level of fourth visible gastral tergite.

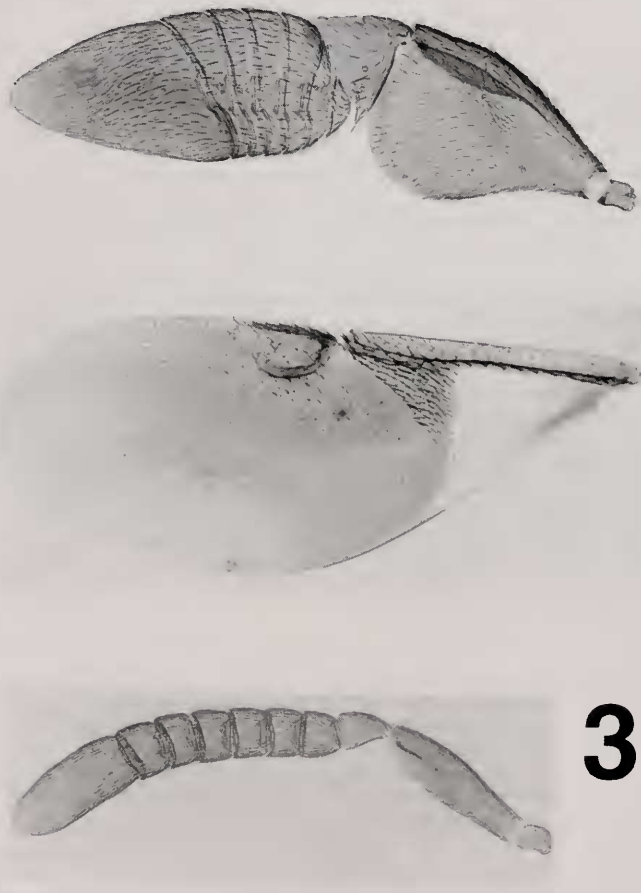
Sculpturing. Frontovertex with very shallow reticulate sculpture and with minute dispersed points. Interantennal elevation, scrobes, and lower part of face with strong cellulate sculpture of rather large meshes. Mesoscutum reticulate. Axilla and scutellum dull, aterciopetiolate, with very small disperse points. Mesopleura with shallow longitudinal reticulate sculpture. Sides of propodeum almost smooth, with very small dispersed points.

Color. Body dark, with some parts more or less metallic. Frontovertex with some bluish-violet-bronze luster. Facial cavity, interantennal elevation, and lower part of face with rather strong bronze-violet luster. Antenna dark, outer side of scape with strong green luster, flagellum with some violet. Palpi and tegula black. Apex and sides of scutellum greenish. Mesopleura dark violet; metapleura dark blue. Forewing (Fig. 2) darkened except basal 1/3 of blade hyaline and devoid of hairs (except for costal cell); apex of wing clearer. Legs black, with pro- and meso-

tarsi brownish-black; mesotibial spur yellowish-white; metatarsus yellowish-white, except distal segment darker. Sides of propodeum bright green. Exserted part of ovipositor sheaths black.

Chaetotaxy. Head (including eyes) not pubescent. Mesoscutum with short black adpressed hairs. Sides of propodeum with small tuft of clear setae on anterior margin.

Male. Length 0.79-1.22 mm. Frontovertex very short, its width somewhat more than 1/2 width of head (2.2:4). Posterior ocelli near occipital margin. Distance between posterior ocelli about 3 x more than distance from posterior ocellus to eye margin and about 2 x more than that to anterior ocellus. Scrobes very deep and long, reaching level of upper eye margin and do not unite above (anterior ocellus just above that level). Outer margin of scrobe touching eye margin. Interscrobal ridge very narrow in middle of face, abruptly broadening beneath level of toruli. Toruli immediately above lower eye margin. Malar space height more than diameter of eye (2:1.5). Antenna (Fig. 3) not strongly broadened as in female. Scape somewhat broadened and flattened,



Figures 1-3. *Neoplatycerus kemticus,* new species. (1) Antenna, female; (2) Forewing, female; (3) Antenna, male.

about 4.6 x as long as wide. Pedicel small, 4.6 x shorter than scape and about 1.7 x as long as its own width at apex. Flagellum only slightly widening towards apex. F1 as long as pedicel and as long as wide, F2 a little shorter than F1 (4:5) and slightly wider than long (5:4), F3 as long as F2 and wider than long (3:2), F4 a little longer than F3 and slightly wider than long (5.5:4.5), F5 a little shorter than F4 and somewhat wider than long (5.5:4), F6 as long as F5 and wider than long (3:2), clava solid, with rounded apex, 2.5 x as longer than wide, as wide as F6 and as long as 4 preceding funicle segments combined.

Mesoscutum about 2 x as wide as long. Forewing 2.5 x as long as its greatest width.

Genitalia as in Fig. 4.

Sculpturing. Lower part of face with reticulate sculpture, but not so deep and pronounced as in female. Scutellum not mat, but rather brilliant, with superficial reticulate sculpture.

Coloration similar to that of female, but entire scutellum with green shine; forewing weakly infuscated (except around stigmal and postmarginal veins); basal half of metabasitarsus dark.

Type material: Holotype female on card labeled: 1."EGYPT: Giza, 15.iv.2000, M. H. Tawfik & A. R. Atia. Ex. *Planococcus ficus* (Signoret) on grape"; 2." *Neoplatycerus kemticus* V. Trjapitzin & S. Triapitsyn HOLOTYPE female". Holotype deposited in BMNH. Paratypes: same data as

Figure 4. *Neoplatycerus kemticus,* new species. Genitalia, male.

holotype, 64 females on 32 cards and 28 males on 16 cards [BMNH]; 7 females, 3 males on points and 1 female, 1 male on slides, labeled: "Egypt, Kafr El-Sheikh, Baltem, 28.viii.2000, A. Hendawy. On grapevine Ex. *Planococcus* sp. (*P. vitis* or *P. citri*)" [UCRC, PPCE, ZISP].

Etymology. The specific name refers to Kemt, one of the names (in free translation) that the ancient Egyptians used to call their country.

Diagnosis. The new species is most closely related to *N. palestinensis* from which it differs in the following characters.

N. palestinensis. Female: head yellowish-brown, vertex slightly darker than the rest of the head; scape yellowish with a violaceous tinge; all tibiae brownish, tarsi all dirty white, except for the following segments: tarsal segments 1 and 5 of foreleg and distal tarsal segment of the middle leg brown, basal half of metabasitarsus violaceous brown; posterior ocelli as distant from each other as from the eye margin; facial cavity not delimited above by an acute margin. Male: scape 3 x as long as broad; clava as long as 3 preceding segments combined.

N. kemticus. Female: head dark, frontovertex with some bluish-violet-bronze luster, facial cavity, interantennal elevation, scrobes, and lower part of face with rather strong bronze-violet luster; scape dark, its outer side with strong green tinge; all tibiae black, pro- and meso- tarsi brownish black, metatarsus yellowish-white except for apical segment darkened; posterior ocelli considerably more distant from each other than from the eye margin; facial cavity delimited above by an acute margin. Male: scape 4.6 x as long as broad; clava as long as 4 preceding segments combined.

Distribution: Known from the type localities in Egypt only.
Hosts: The vine mealybug, *P. ficus.*

Comments. Like other species in the same genus, *N. kemticus* may not be monophagous; its range of probable mealybug hosts in the area of origin remains to be investigated.

Neoplatycerus palestinensis (Rivnay, 1945)

Tropidiophryne [sic!] *palestinensis* Rivnay, 1945: 119-121.
Neoplatycerus palestinensis (Rivnay); Trjapitzin, 1989: 125.

Type locality: Jerusalem, Palestine [now Israel].
Material examined: ISRAEL, Tel Aviv, 1987, Y. Ben-Dov, 1 female, "ex. *Ferrisia virgata*" (det. J.S. Noyes) [BMNH].
Distribution: Israel.
Hosts: *Eriopeltis* sp. (Coccidae), the striped mealybug, *Ferrisia virgata* (Cockerell) (new host record), and the citrus mealybug, *Planococcus citri* (Risso) (Pseudococcidae).

Comments. This species was described from Palestine (now Israel) by Rivnay (1945) from two series of specimens, one from *Eriopeltis* sp. on a composite thistle in Jerusalem and the other from the citrus mealybug, *P. citri,* on pomegranate in Rehovoth (altogether 6 females, 3 males). He placed this species in the genus *Tropidophryne* Compere. As Rivnay (1945) wrote (pp. 120-121"), "Type and allotype to be deposited in the British Museum, one paratype female will be deposited in each of the following: United States Na-

tional Museum, Washington, D.C.; Collection of the Entomological Society of Southern Africa, Pretoria; Collection of the Entomological Society of Egypt, Fouad 1er, Cairo. Other paratypes will be retained in the collection of the Agricultural Research Station at Rehovoth".

In 1966, the senior author met Prof. Rivnay in his home at Rehovoth (now Rehovot) and asked him about the types of his *Tropidophryne palestinensis*. He answered that he had sent all the material away as indicated in his publication. However, Dr. David Rosen could not find at that time the specimens of *T. palestinensis* in the collection of Faculty of Agriculture of the Hebrew University (of Jerusalem) at Rehovot.

Kerrich (1978), revising the genera *Tropidophryne* and *Neoplatycerus,* wrote (p. 130) that the holotype of Rivnay's species was lost and neither of the collections mentioned above could be found and that "Dr. Rivnay has most kindly sent the material that he had at that date (1965) been able to trace in Israel, and allowed it to be retained for the British Museum (Natural History) collection. It consists of three slides: 1) a mount of the right antenna and forewing of a male, labeled: "Jerusalem, Bytinski-Salz", presumably from the same series as the holotype; 2) a mount of a whole female specimen from Rehovoth, September 1942, ex. *P. citri* on pomegranate, E. Rivnay; and 3) a mount of the right antenna and forewing of a female labeled same as the above female".

Neoplatycerus palestinensis has the facial impression sharply marginated only laterally, as in *Zarhopalus* Ashmead. Kerrich treated this species in the genus *Tropidophryne* but doubted the correctness of such a placement. Rivnay (1960) himself supposed that his *Tropidophryne palestinensis* might belong to an undescribed genus. Trjapitzin (1971) stated that it does not belong to *Tropidophryne* and later transferred this species to *Neoplatycerus* (Trjapitzin 1989).

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